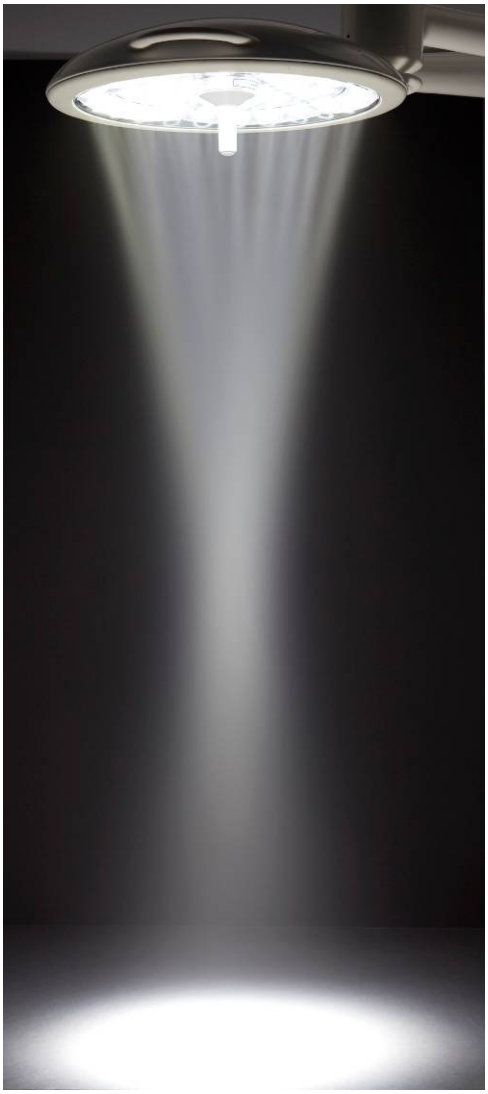
NUVO, INC.

VistOR MS LED Surgical Light



INSTALLATION AND SERVICE MANUAL

VistOR MS LED
Agency Approvals

Medical Electrical Equipment
With respect to electric shock, fire
And mechanical hazards only
In accordance with IEC60601-1:2006 / CAN/CSA C22.2 No.601.1-M90 with updates 1 & 2.
Classifications:

1. Protection against electrical shock (5.1, 5.2). Class I permanently connected,
2. Protection against harmful ingress of water (5.3). None.
3. Degree of safety in the presence of flammable anesthetics or oxygen (5.5). Not suitable for use in the presence of flammable anesthetics or oxygen.
4. Mode of operation (5.6). Continuous
5. Surgical luminaries (IEC60601-2-41)

Electromagnetic compatibility for immunity
And emissions in accordance with
EN-60601-1-2(2001) Class B and CISPR 22 (1997) Class B

Medical Electrical Equipment
Particular requirements for the safety of surgical
luminaries and luminaires for diagnosis
In accordance with IEC-60601-2-41

Intended use

The VistOR MS LED Surgical Lighting System is an AC powered device which provides a focusable field of illumination for general examination and surgery.

VistOR MS LED

Surgical Lighting System Installation and Service Manual

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VistOR MS LED

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Definition of Terms

I.E.C. International Electrotechnical Commission

TUV TUV SUD America

Medical Electrical Equipment
Electrical equipment intended to diagnose, treat the patient under medical supervision. Electrical equipment that transfers light energy to the patient**.**

Central Illuminance
Illuminance of light head measured at 1 meter from the light emitting area with no obstructions. The value is expressed in Foot-candles or Lux.

Light Field Center
The point of maximum illuminance in lighted area. This is the reference point for light field size and light distribution measurements.

Light Field Diameter
The diameter of the circle where illuminance reaches 10% of light field center illuminance.

Depth of Illumination
The distance above and below 1 meter to where the central Illuminance is reduced to 20%.

Shadow Dilution
The ability of the equipment to minimize the impact of shadows in the working area due to partial obstruction by the operator or other medical personnel.

Correlated Color Temperature
The color temperature of the light fixture when compared to a blackbody radiator expressed in degrees Kelvin.

Total Irradiance
The total amount of energy imparted to the patient by the lighting system expressed in Watts/meter squared.

Color Rendering Index (CRI)
A method of how well a light source will render other colors when illuminating them based upon eight CIE chromaticity coordinates measured with a spectroradiometer.

Sterilizable Handle
An easily removable device that when properly sterilized maintains a sterile area in order to handle it under aseptic conditions when attached to the equipment.

Definition of Terms (continued)

Head/Yoke Assembly
The part of the device which includes the light source, heat removal system and light focusing system.

Arm Assembly – Extension/Articulating Arm
Horizontal section of the positioning arm with pivots that is used to increase the area covered by the light head and articulating arm. The articulating arm allows for vertical positioning of the light head.

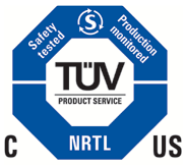
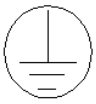
Light Mounting
Support apparatus used to connect arm assembly/light head to a fixed surface, consisting of either a single, double or triple ceiling mount.

Neutral Conductor (common)
In an AC circuit, the return line for current.

Protective earth ground
The conductor used to connect the non-current-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor, the grounding electrode conductor, or both, of the circuit at the service equipment or at the source of a separately derived system.

Off Center Moment
The unit of measurement for torque which is caused by an off-center load. Measured in foot-pounds.

List of symbols

	TUV Listing marking
	Read accompanying documents
	C.E. Marking
	Fuse marking
	Protective earth ground
	Neutral conductor
	Caution
	Electric shock hazard

Nuvo, Inc.
Lighting Equipment
Limited Warranty

This document comprises the general terms of your product's Limited Warranty. By accepting the shipment of the product, the owner/purchaser agrees to adhere to the warranty terms and conditions expressed herein.

Nuvo, Inc. ("Nuvo") Lighting Equipment is warranted against defective material and/or workmanship, excluding normal replacement parts (e.g. bulbs, sterilizable handles or glass items), for a period of three (3) years from the date of shipment. This Limited Warranty applies exclusively to the repair or replacement of parts recognized as defective by Nuvo that are in normal use and have not been modified or repaired by unauthorized personnel.

This Limited Warranty extends only to the first retail purchaser of a product, and is not transferable or assignable. This warranty supersedes all other guarantees or warranties, expressed or implied.

WARRANTY SERVICE & REPAIRS

Nuvo does not provide (or give any compensation for) outside repair services or field labor. Therefore, in the event of a failure covered under this warranty, please take the following immediate action:

1. Contact Nuvo via phone at (814) 899-4220 opt 2, through our website at http://www.nuvosurgical.com, or by facsimile at (814) 899-1410.

   A. Be prepared to give the model number, serial number, and full description of the failure.

   B. Our Customer Service department will attempt to solve the problem over the phone. If it becomes necessary to send the product to the factory for repair, you will be provided with a Return Authorization number. Products sent to the factory without a Return Authorization number will not be accepted.

2. It is the retail purchaser's obligation to arrange for shipment return of a product to the factory for warranty service, which shall be at the retail purchaser's expense. Carefully package the light component (light head, arm assembly, mount assembly, etc.) and return it, freight prepaid and insured, with the Return Authorization number clearly marked on the outside of the box, to:

Nuvo
547 Library Street
San Fernando, CA 91340
RA#_____

Damage resulting from inadequate packing is not covered by this warranty, and shipping insurance does not cover damage due to inadequate packing. We recommend that the package be insured against loss or in-transit damage. Nuvo cannot be held responsible for in-transit loss or damage. In the event that freight-related damage should occur, Nuvo will notify you immediately so that you can file a damage claim with the proper freight carrier.

Within the aforementioned time period of three (3) years from date of shipment, Nuvo will evaluate the returned product, repair as appropriate, and ship the product back to you with freight costs prepaid by the Company. In the event that non-warranty damage or failure is discovered, you will be contacted before any repairs are performed.

EXCLUSIONS

This Limited Warranty does not cover the following:

- Any field labor or outside services (electricians, contractors, installation services, routine maintenance or other repair services)
- Damage to the product resulting from tampering, accident, abuse, negligence, alteration, or other causes unrelated to problems with material and/or workmanship
- Damage due to improper installation, use, cleaning or maintenance, as outlined in the Installation and Service Manual for the product
- Labor costs associated with removing, re-packaging for shipment or reinstalling product

PRODUCT RETURNS:

Please contact the authorized dealer from whom the product was purchased to inquire about a product return. Additional terms and conditions set by the dealer may apply for any returned items.

SHIPMENT DAMAGE:

If the initial shipment of your purchased product arrived in damaged condition, please leave the packaging and its contents intact and contact Nuvo immediately.

Mechanical Specifications

Parameter	Value
Weight Solo ceiling mount assembly Duo ceiling mount assembly Trio ceiling mount assembly Light head assembly	 Approximately 73.5 lbs (33.3 Kg) Approximately 104.5 lbs (47.4 Kg) Approximately 155.5 lbs (70.5 Kg) Approximately 28.1 lbs (12.7 Kg)
Dimensions Ceiling casting Ceiling rod Arm (articulated) Light head assembly	 17.0” (431,8 mm) Dia. x 4.7” (119.4 mm) deep 2.5” (63.5 mm) Dia. x 9.0”-43.0”(228.6 -1092.2 mm) long (depending on ceiling height) 4.0” (102 mm) Dia. (tapered) x 26.0” (660 mm) long 25.5” (648 mm) Dia. 4.75” (120 mm) deep
Rotations Ceiling mount/extension arm interface Articulating/extension arm interface Articulating arm vertical movement Articulating arm/Yoke interface Yoke/lamp head interface	 Continuous Continuous +15 Degrees, -65 Degrees Continuous +/- 150 Degrees (300° range)

Electrical Specifications

Parameter	Value
Voltage Input Voltage	 100 - 240 VAC 50/60 Hz – Single Phase
LED life	50,000 hours (average)
Power Solo Duo Trio	 120 Watts 240 Watts 360 Watts

Optical Specifications

Parameter	Value
Correlated Color Temperature	4,200 °Kelvin ±300 °K
Irradiance	128 W/m^2 (1 m)
Color Rendering Index	88
Parameter	**Value**
Focal length	39” (1 meter)
Central illuminance (adjustable)	120,000 Lux
Light field diameter (adjustable)	207 mm
Depth of illumination	79”
Diameter (d50)	126 mm
Illuminance (one mask)	6,458 fc
Illuminance (two masks)	5,250 fc
Illuminance at bottom of standard tube	6,781 fc
Illuminance at bottom of standard tube with one mask	6,227 fc
Illuminance at bottom of standard tube with two masks	5,382 fc

Environmental Specifications

Parameter	Value
Operating temperature	41° - 104° F (5°-40° Celsius)
Storage temperature range	41° - 104° F (5°-40° Celsius)
Humidity	10 - 90% relative humidity

Section 3

Pre-Installation Guidelines

SPECIAL NOTE: Installation and repair of this equipment should be performed by a qualified mechanical contractor only. Nuvo, Inc. does not warranty any damage occurring as a result of improper installation.

It is recommended that this installation manual be completely reviewed prior to installation.

Before installation, check to ensure the following minimum conditions are provided:

- The structural ceiling mount is designed to support a vertical load of 300 lbs (trio) and an off-center moment of 960 ft-lbs, the solo light is significantly less. The structural mount should meet all local building codes.

A structural mount that does not meet these minimum conditions can cause serious injury and/or property damage.

Failure to use the correct mounting hardware can cause the arm/head assembly to become unstable, causing serious injury and/or property damage. If the ceiling mounting surface is not level, shim the ceiling casting to level the assembly.

Failure to level the ceiling casting may cause unwanted arm "drifting" during use.

- It is recommended that the VistOR MS LED surgical lighting system be mounted directly over a 4-0 junction box. If this is not possible the input power supply lines should be wired in accordance with all applicable building codes.
- The supply circuit line must be as follows:
  120 VAC lights-110-120 VAC 50/60 Hz, single phase, three wire, capable of supplying 525 watts @ 5 amperes.
  230 VAC lights- 220-240 VAC, 50/60 Hz, single phase, three wire, capable of supplying 525 watts @ 2.5 amperes.
- The power supply circuit must be in compliance with all applicable building codes.
- The light head switches secondary transformer power only. It is recommended that the VistOR MS LED Surgical Lighting System is connected to its own supply circuit with integral circuit breaker. The circuit breaker will act as the supply main disconnect switch.

Failure to provide a circuit meeting these minimum standards or complying with local building codes can cause a shock hazard.

- Check the length of the ceiling rod supplied to make sure that it is the proper length to install and operate the light without interference or over reach. (See ceiling Rod Calculation).

Installation of optional Nuvo Mounting Plate G2A00043

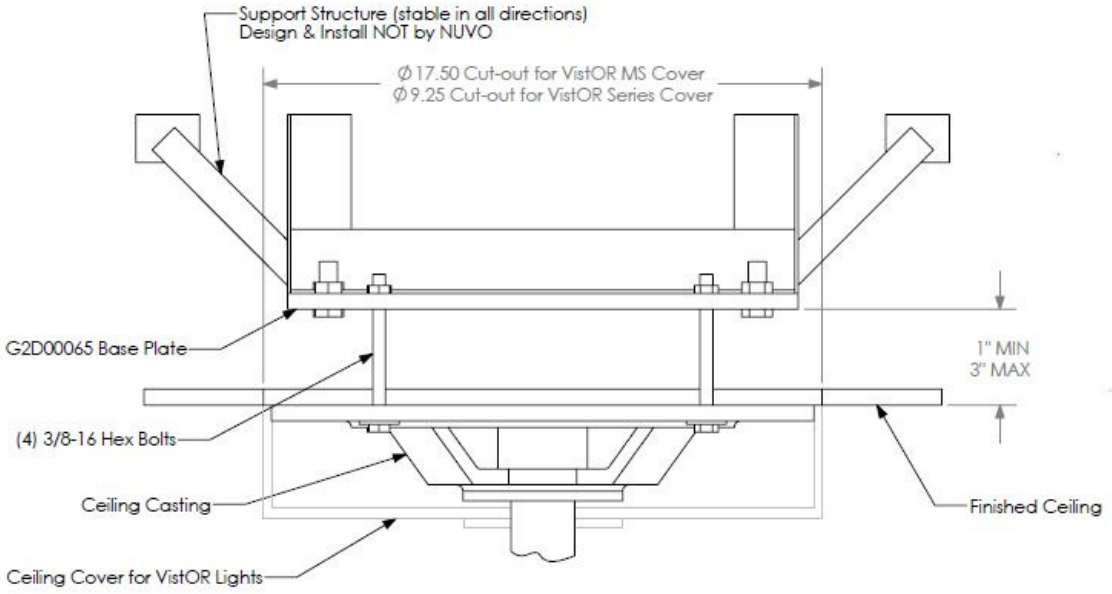
Notes:
The pre-install plate can be supplied by NUVO. It is recommended that this plate be welded to the support structure.
Alternatively, the plate may be mounted to the support structure with the (4) 5/8" clearance holes.
Do not obstruct any of the equipment mounting holes in this plate.

The VistOR MSLED light ceiling casting is mounted to (4) 3/8-16 tapped holes located on the 14-1/2" bolt circle.

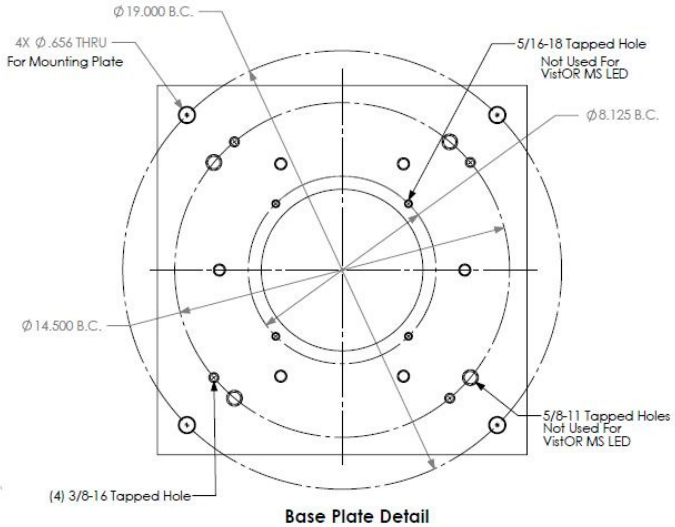
References: Installation & Service Manual for VistOR MS LED lights.

Loading Data:

	Vertical Load	Bending Moment
VistOR MS	300 lbs.	960 ft-lbs.


Support Structure (stable in all directions)
Design & Install NOT by NUVO
Ø17.50 Cut-out for VistOR MS Cover
Ø9.25 Cut-out for VistOR Series Cover
G2D00065 Base Plate
(4) 3/8-16 Hex Bolts
Ceiling Casting
Ceiling Cover for VistOR Lights
1" MIN
3" MAX
Finished Ceiling

VistOR MS LED Light Mounting Detail



Base Plate Detail

Section 3

Pre-Installation Guidelines

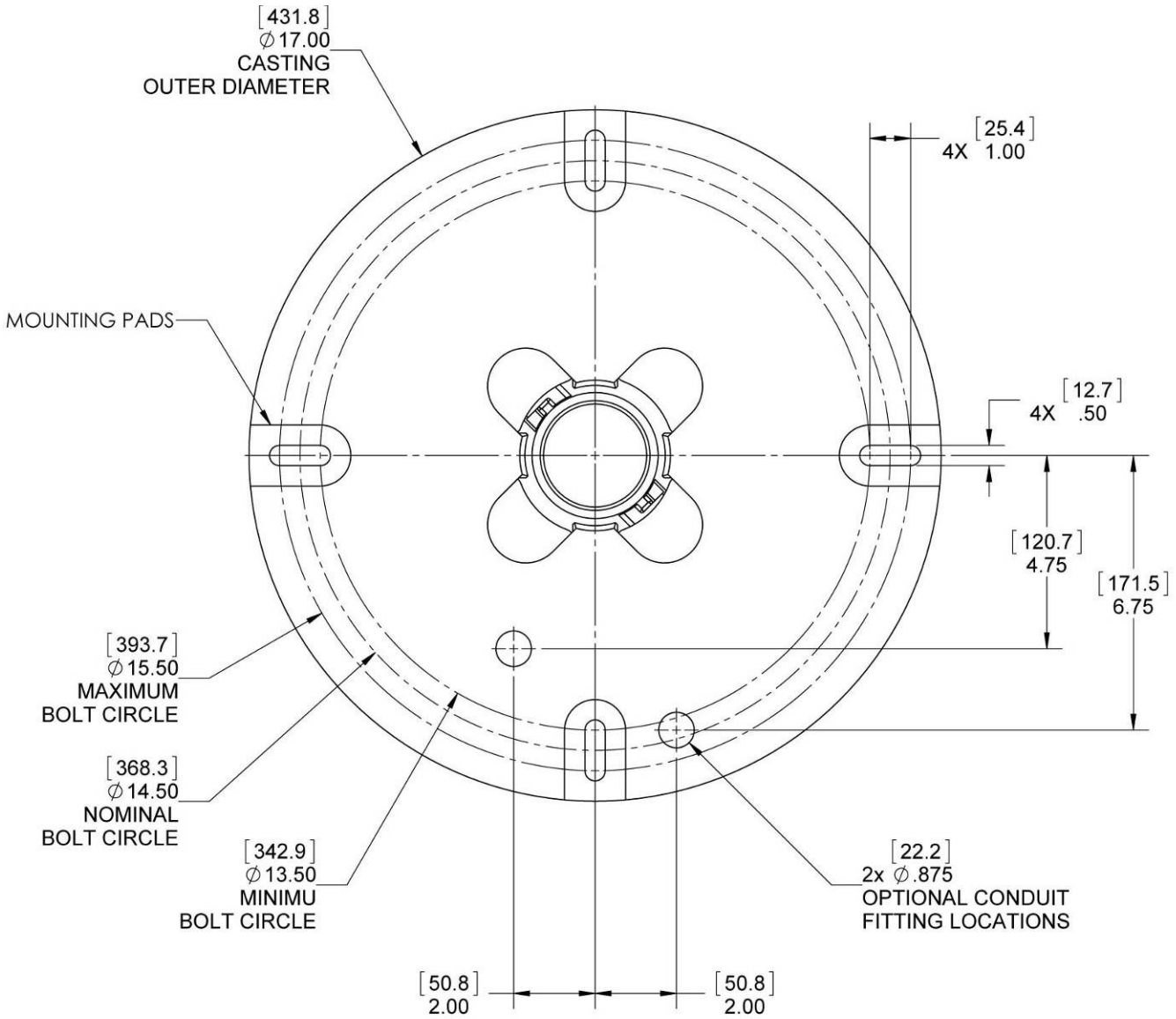


Figure 1: Mounting Dimensions for Ceiling Casting
Top View
[Dimensions with brackets are in millimeters]

Ceiling Rod Calculation, Solo Mount

Use the following table to select the correct length ceiling rod for your application.

Ceiling Mounting Height (Y Value)	Ceiling Rod Length	"X" Value	Head room to bottom of extension arm (y value-x value)
8'0" (2.4m)	N/A	20.0" (508.0mm)	96" (2.4m)
9'0" (2.7m)	9.4" (238.7mm)	29.5" (749.3mm)	108" (2.7m)
9'6" (2.9m)	13" (330.2mm)	33.0" (838.2mm)	108" (2.7m)
10'0" (3.0m)	19" (482.6mm)	39.0" (990.6mm)	120" (3.0m)
10'6" (3.2m)	25" (635.0mm)	45.0" (1,143.0mm)	120" (3.0m)
11'0" (3.3m)	31" (787.4mm)	51.0" (1,295.4mm)	132" (3.3m)
12'0" (3.6m)	43" (1092.2mm)	63.0" (1600.2mm)	144" (3.6m)

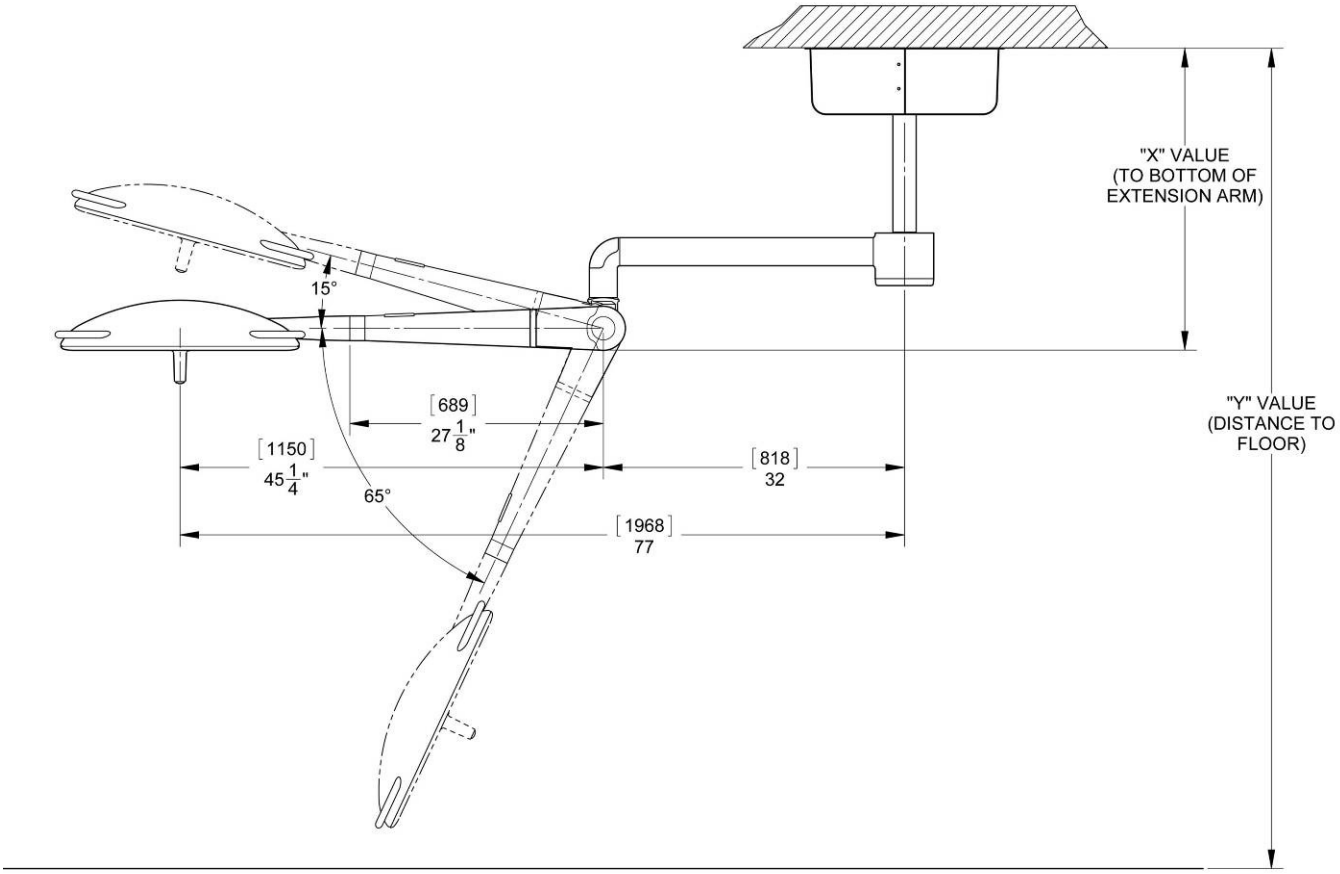


Figure 2: Ceiling Rod Calculation Solo Mount

Ceiling Rod Calculation, Duo Mount

Use the following table to select the correct length ceiling rod for your application.

Ceiling Mounting Height (Y Value)	Ceiling Rod Length	"X" Value	Head room to bottom of extension arm (y value-x value)
8'0" (2.4m)	N/A	25.0" (635.0mm)	96" (2.4m)
9'0" (2.7m)	9.4" (238.7mm)	34.5" (876.3mm)	108" (2.7m)
9'6" (2.9m)	13" (330.2mm)	38.0" (965.2mm)	108" (2.7m)
10'0" (3.0m)	19" (482.6mm)	44.0" (1,117.6mm)	120" (3.0m)
10'6" (3.2m)	25" (635.0mm)	50.0" (1,270.0mm)	120" (3.0m)
11'0" (3.3m)	31" (787.4mm)	56.0" (1,422.4mm)	132" (3.3m)
12'0" (3.6m)	43" (1092.2mm)	68.0" (1,727.2mm)	144" (3.6m)

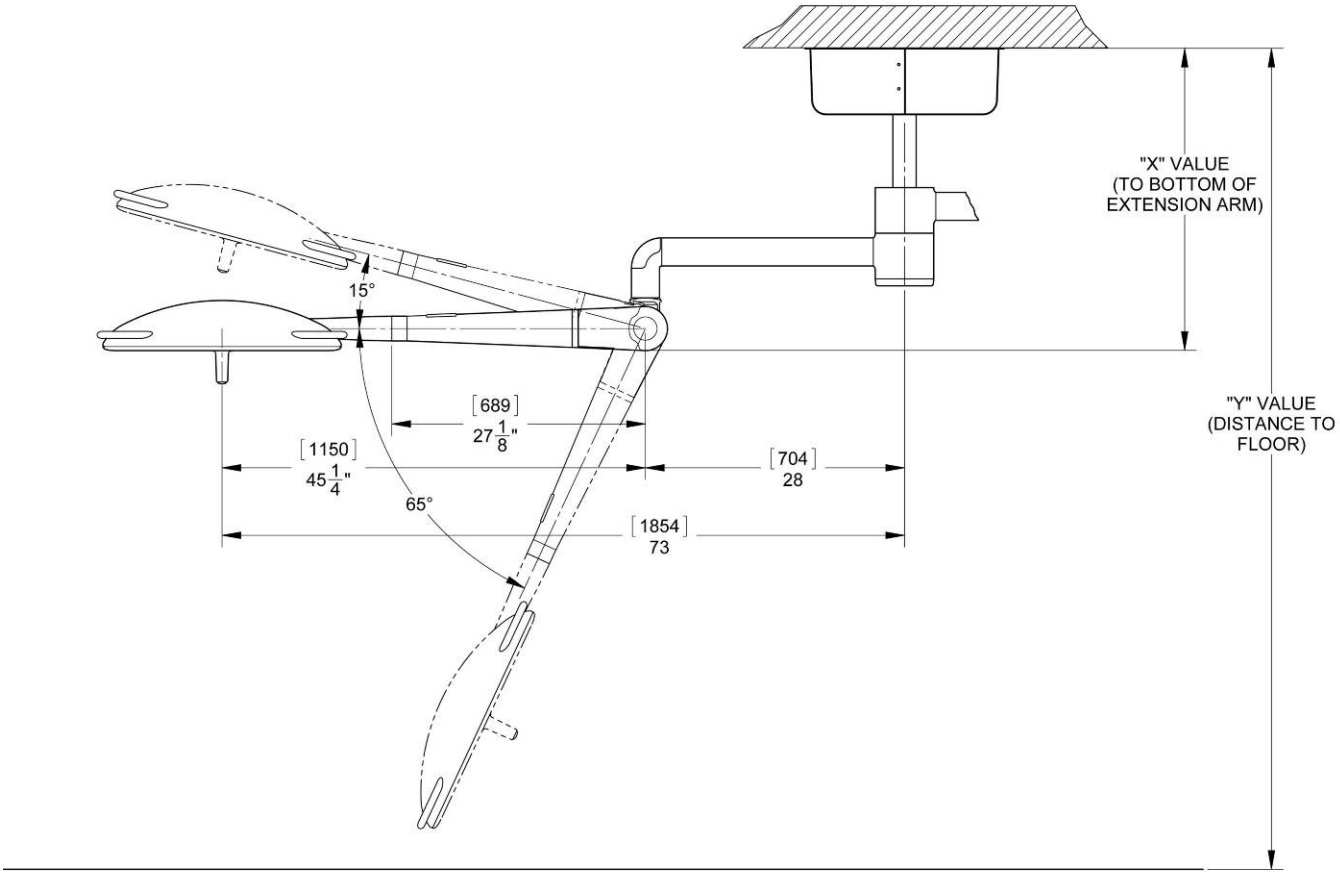


Figure 3: Ceiling Rod Calculation Duo Mount

Ceiling Rod Calculation, Trio Mount

Use the following table to select the correct length ceiling rod for your application.

Ceiling Mounting Height (Y Value)	Ceiling Rod Length	"X" Value	Head room to bottom of extension arm (y value-x value)
8'0" (2.4m)	N/A	30.0" (762.0mm)	96" (2.4m)
9'0" (2.7m)	9.4" (238.7mm)	39.5" (1,003.3mm)	108" (2.7m)
9'6" (2.9m)	13" (330.2mm)	43.0" (1,092.2mm)	108" (2.7m)
10'0" (3.0m)	19" (482.6mm)	49.0" (1,244.6mm)	120" (3.0m)
10'6" (3.2m)	25" (635.0mm)	55.0" (1,397.0mm)	120" (3.0m)
11'0" (3.3m)	31" (787.4mm)	61.0" (1,594.4mm)	132" (3.3m)
12'0" (3.6m)	43" (1092.2mm)	73.0" (1,854.2mm)	144" (3.6m)

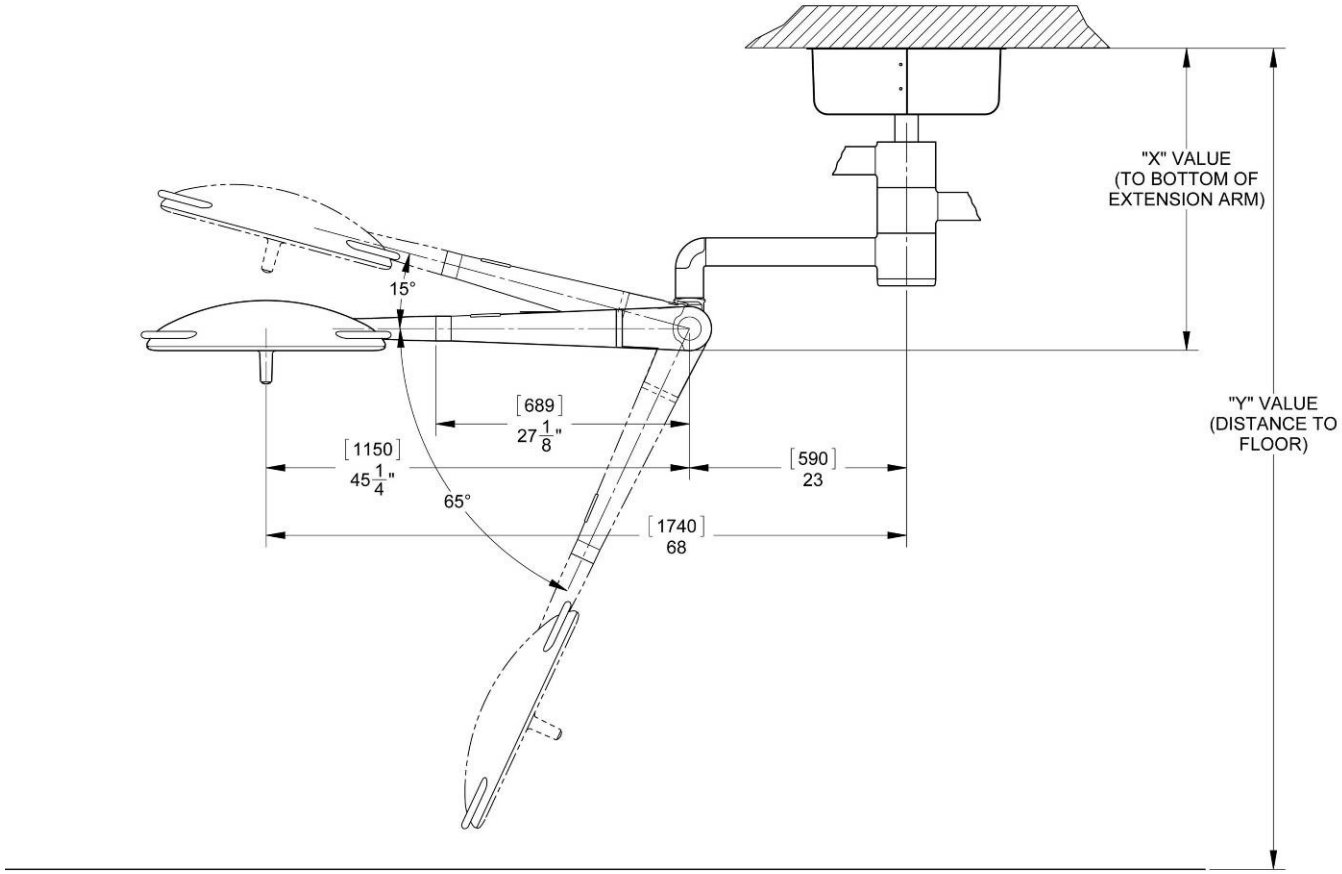


Figure 4: Ceiling Rod Calculation Trio Mount

Section 3

General Information

The VistOR MS LED, ceiling mounted, orbital lighting system is offered in three arm configurations, Solo, Duo & Trio. The system is shipped in separate cartons. The ceiling casting assembly, hardware kit and this manual are in one carton. The arm assembly and ceiling rod/adapter assembly are in one carton. The Light Head/Yoke assemblies are located in individual cartons.

Note: **There are 6 standard length extension rods for different ceiling heights**. Verify that your ceiling rod length is correct for your ceiling height.

Note: Ceilings under 8 ½ feet do not require an extension rod and adapter. If not correct please contact customer service. For ceiling heights greater than 11 feet the ceiling rod/adapter assembly will be shipped separately. Prior to installation ensure that all components shown in Figure 5 are present.

⚠ WHEN REMOVING PARTS FROM THE SHIPPING CARTONS, BE CAREFUL NOT TO DAMAGE THE COMPONENTS.

IMPORTANT: THOROUGHLY CHECK EACH BOX FOR PARTS THAT MAY BE LOCATED IN AREAS THAT CAN BE OVERLOOKED.

Installation
Ceiling Mount

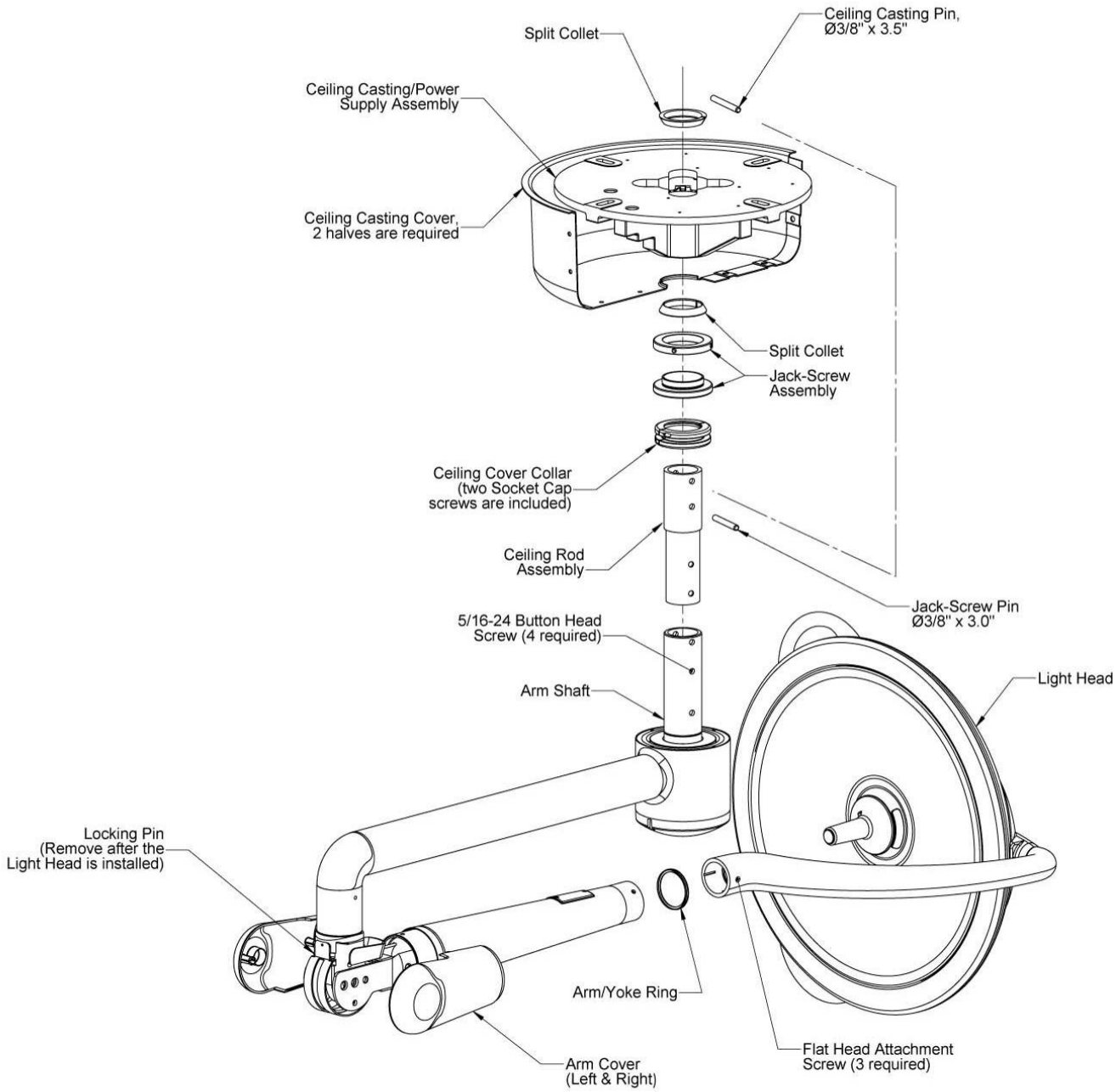


Figure 5: Shown, sub-assemblies for a Solo, ceiling mount.
The same installation applies for the Duo & Trio.
Note: Do not remove locking pin until light head is installed on arm.

Ceiling Mount Installation

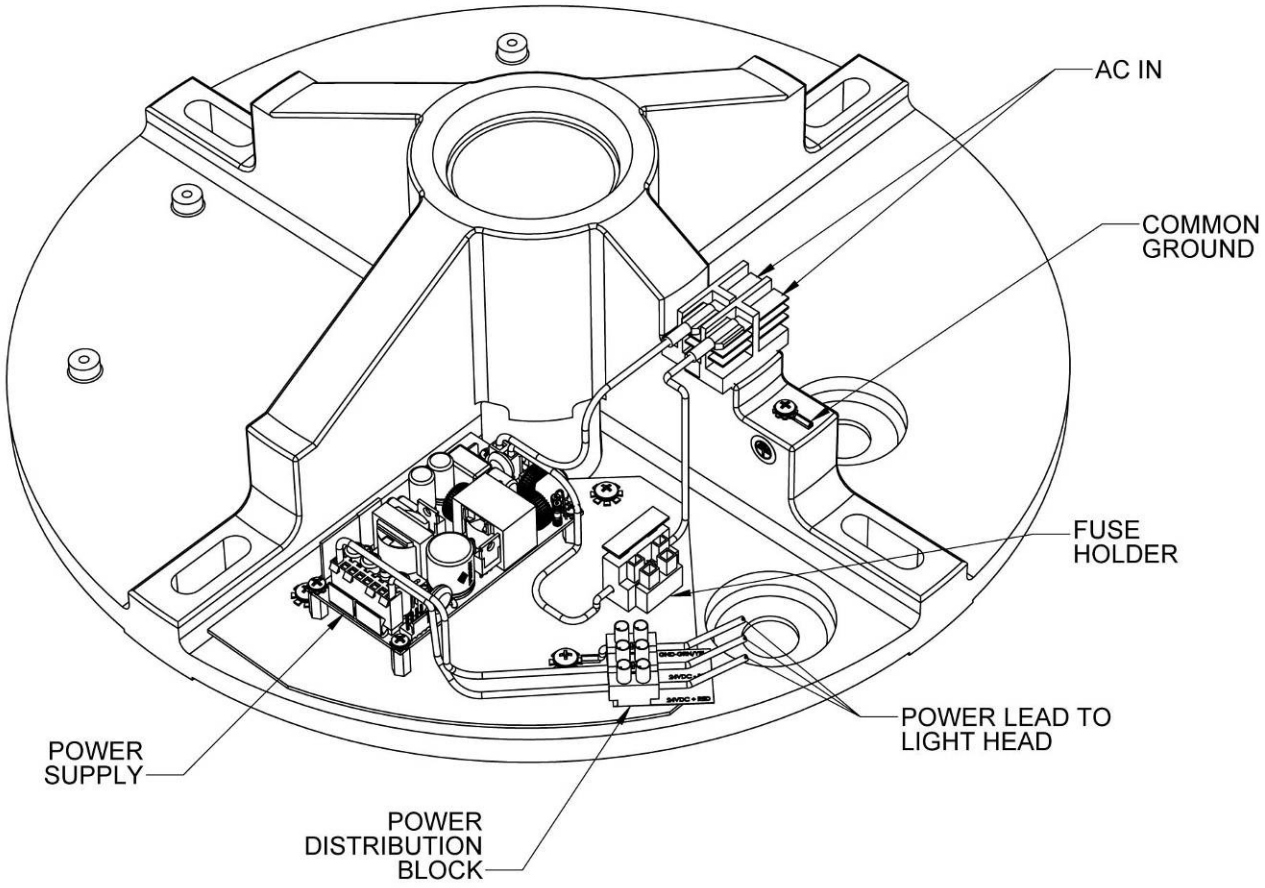


Figure 6: Ceiling Mount
(Note: Shown as a Solo with Power Supply)

Electrical Connection

When connecting the VistOR MS LED to power ensure that all connection are made in accordance with the local building codes standards. See FIG 12 for electrical connection.

Section 3

Installation
Ceiling Mount

Locate the cartons containing the arm assembly and the ceiling casting and unpack following the instructions on the outside of the container. Remove the contents such that the arm assembly is sitting by its self on top of the lower packing foam component. Assemble the arm assembly with the ceiling mounting components shown in Figure 8.

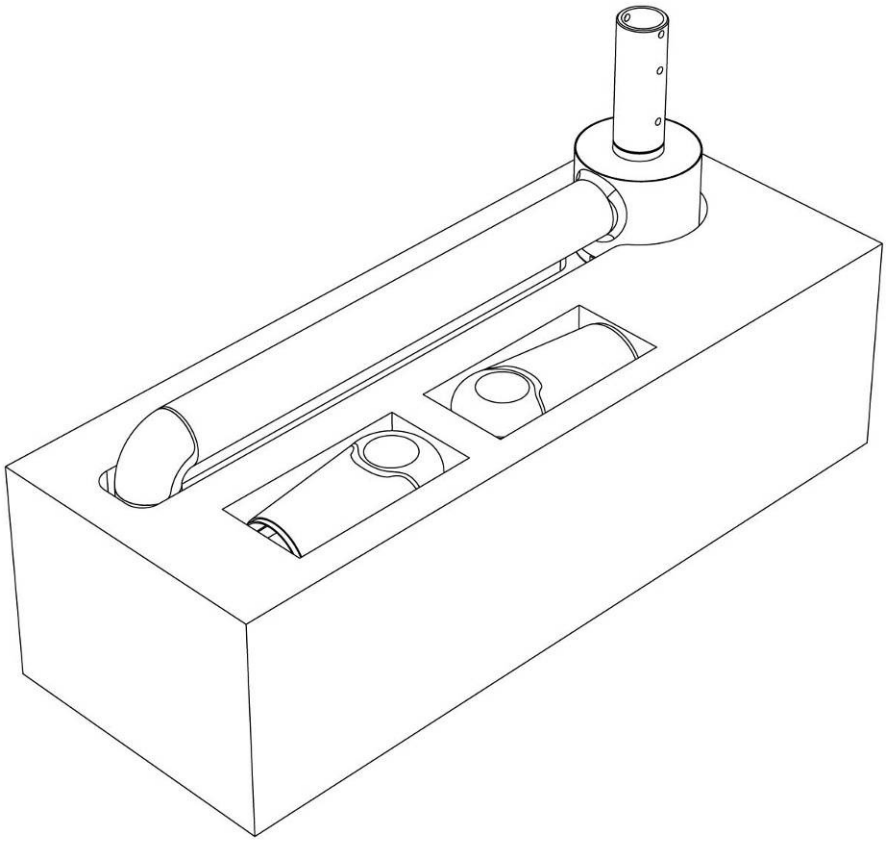


Figure 7: Unpacking and installation setup.

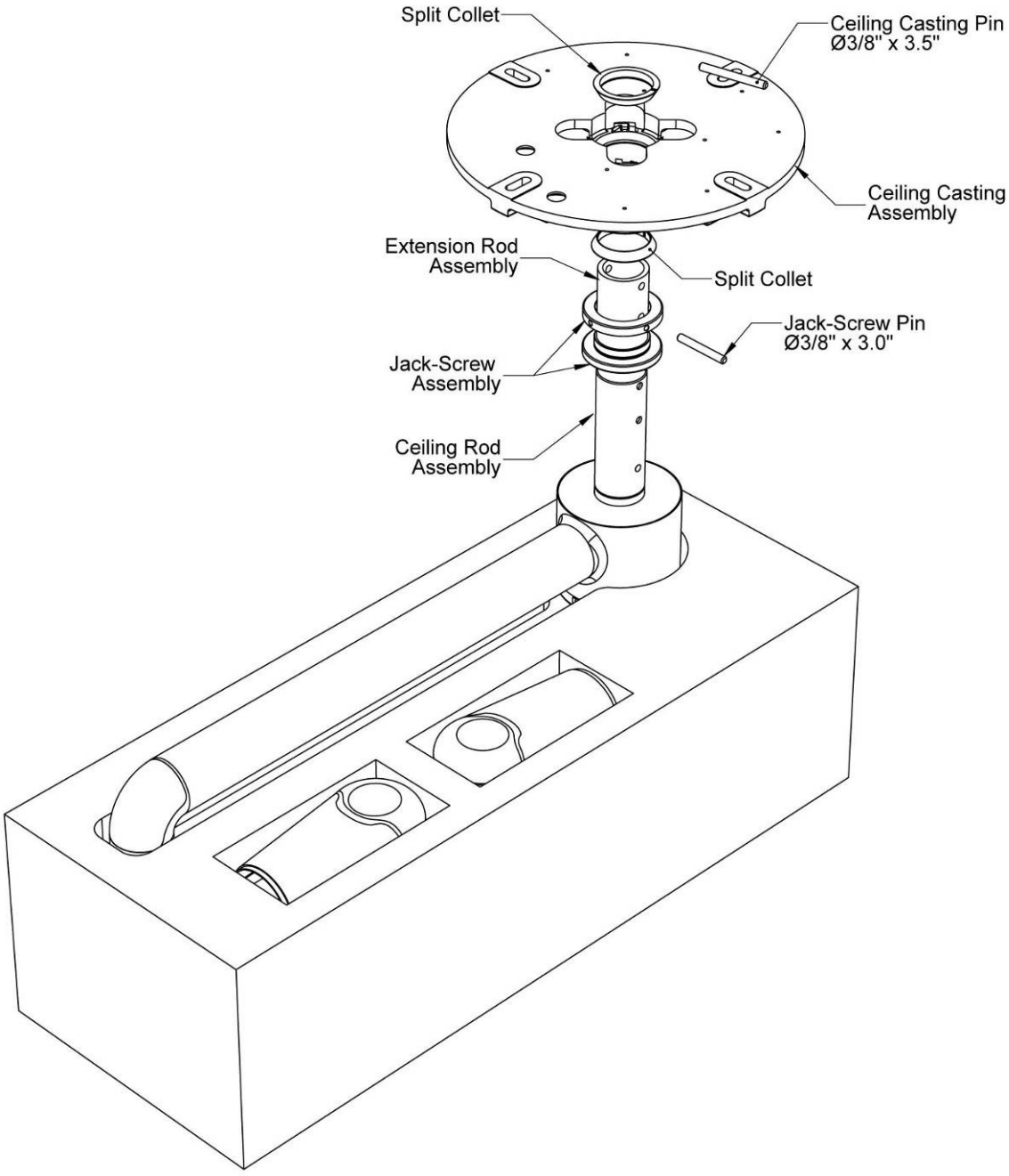


Figure 8: Installation setup

For ceiling heights 8 ½ - 12 feet (this will vary for solo, duo & trio)
Before installing the ceiling casting assembly to the arm spindle shaft, determine the appropriate extension rod length (see figures 2, 3 or 4). With the appropriate extension rod, place the large arm ring over the ceiling rod/adapter, and slide the ceiling rod assembly onto the spindle shaft, aligning the four screw holes (see figure 8).

Install the four $^{5}/_{16}$-24 button head screws to secure the arm shaft to the ceiling rod/adapter. Complete the assembly as shown in figure 8.

⚠ Failure to tighten the $^{5}/_{16}$-24 button head screws can cause the arm/head assembly to become unstable causing serious injury and/or property damage.

For all ceiling heights
Insert the 3/8 x 3" long dowel pin into the 3rd thru hole from the end of the shaft. Screw the two parts of the Jack-Screw assembly together. Slide the Jack-Screw assembly over the shaft, so that the 3" long dowel pin is fully seated into the notch on the Jack-Screw (see figure 8).

Slide one of the split tapered collets onto the shaft, tapered end pointed toward the end of the shaft (see figure 8).

Slide the ceiling casting onto the spindle shaft.

Place the other split tapered collet into the tapered counter bore in the top side of the casting and then insert the cable(s) thru the shaft hole in the ceiling casting and thru the collet.

Insert the 3.5" dowel pin thru the access holes in the ceiling casting and into end hole in the spindle shaft. Make sure the pin is on top of the split collet.

Rotate the ceiling casting counter clockwise such that the dowel pin slides up the locking notch ramp and into the locking slot (see figures 10 & 11).

⚠ Make sure that the both dowel pins are seated into their respective slots. Failure to do so could result in damaging the light head arm assembly or cause personal injury.

Hand-tighten the Jack-Screw assembly removing most of the play. Final tightening must be accomplished after the ceiling casting has been bolted in place. Use the two Jack-Screw tightening rods in the hardware kit to tighten.

Feed the arm power cables thru the ceiling casting large access holes and connect each arm power cable to the appropriate power-supply. Using the lower packing foam component, hoist or lift the arm assembly toward the ceiling. *Using the foam packing component will prevent the arm from swinging around and assist the installation.* The power input cable (not supplied) should be run through the large access holes nearest to the power distribution block (see figure 6).

Install the ceiling casting on the ceiling using four ⅜" bolts and washers. It is recommended that only Grade 8 or equivalent fasteners be used for the installation. Make sure the ceiling casting is level. **Note: Mounting plate kit G2A00043 can be purchased from Nuvo. This kit comes complete with 3/8" hardware.**

Using the two Jack-Screw tightening bars, finish tightening the Jack-Screw (see figure 9). To assist tightening wiggle the arm assemble while tightening to remove any excess play. Make sure all play has been removed between the Jack-Screw, the spindle shaft and ceiling casting.

Arm and Ceiling Casting Assembly

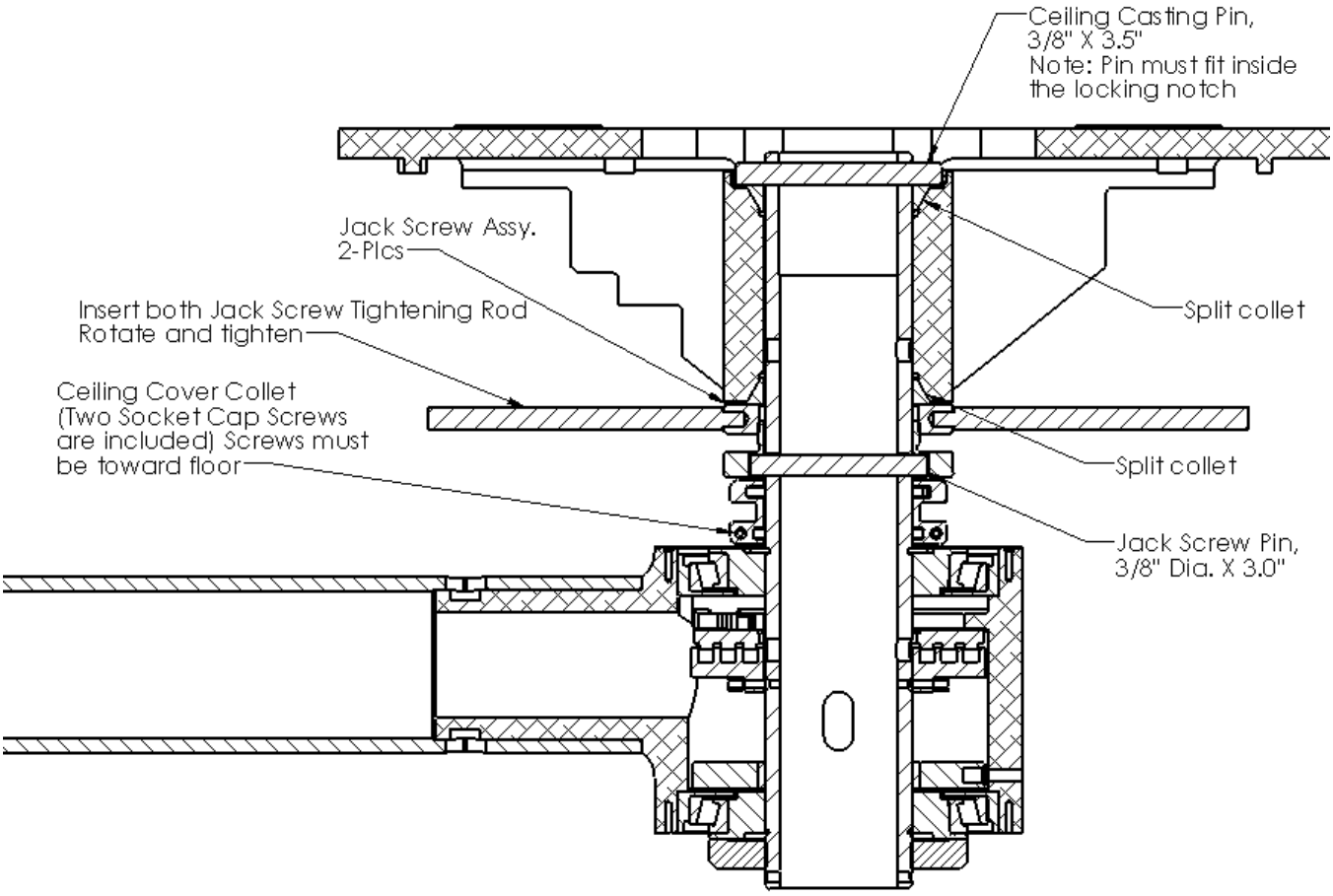


Figure 9: Arm and Ceiling Casting assembly

Installation, Ceiling Mount

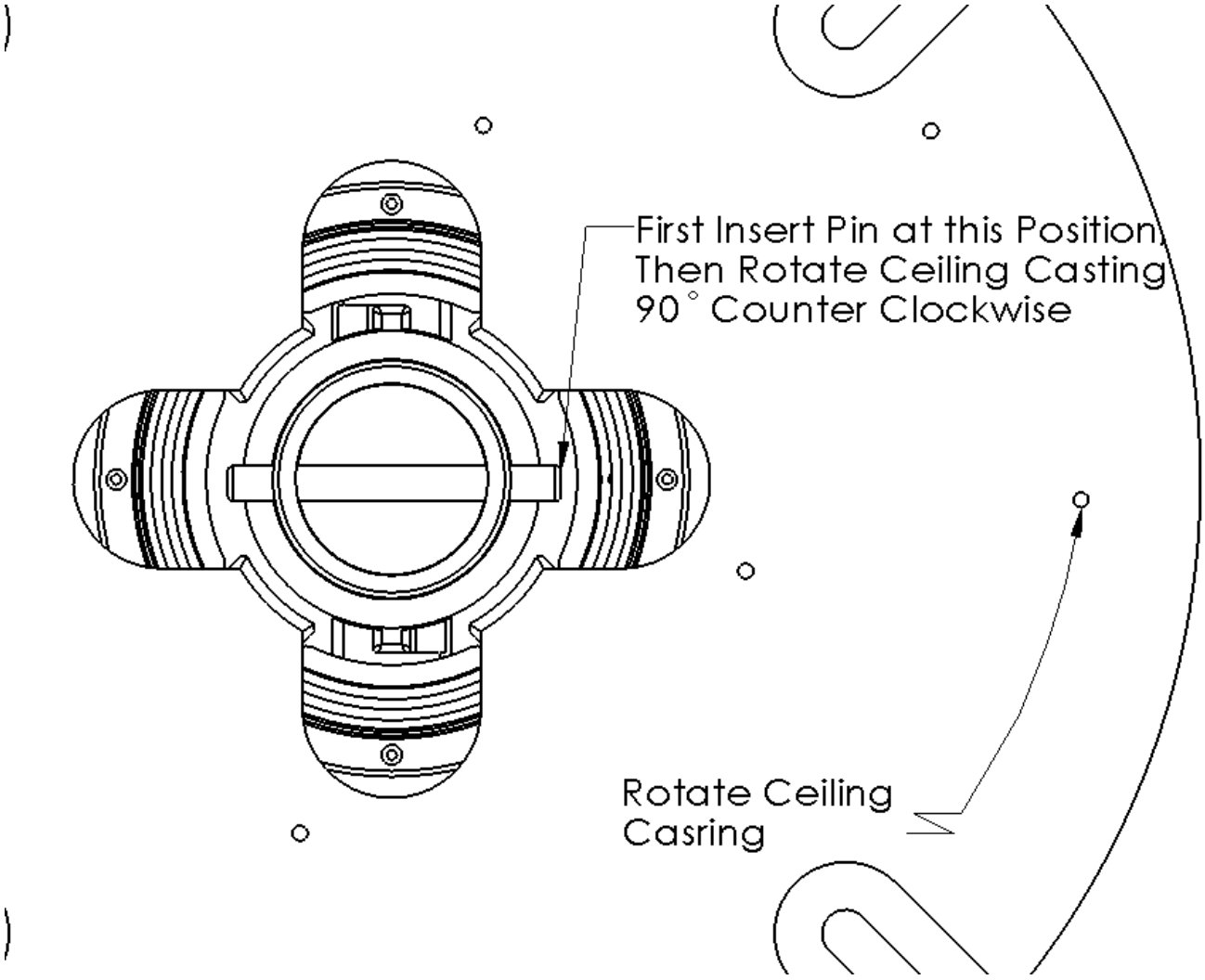


Figure 10: Ceiling & Shaft dowel pin insertion

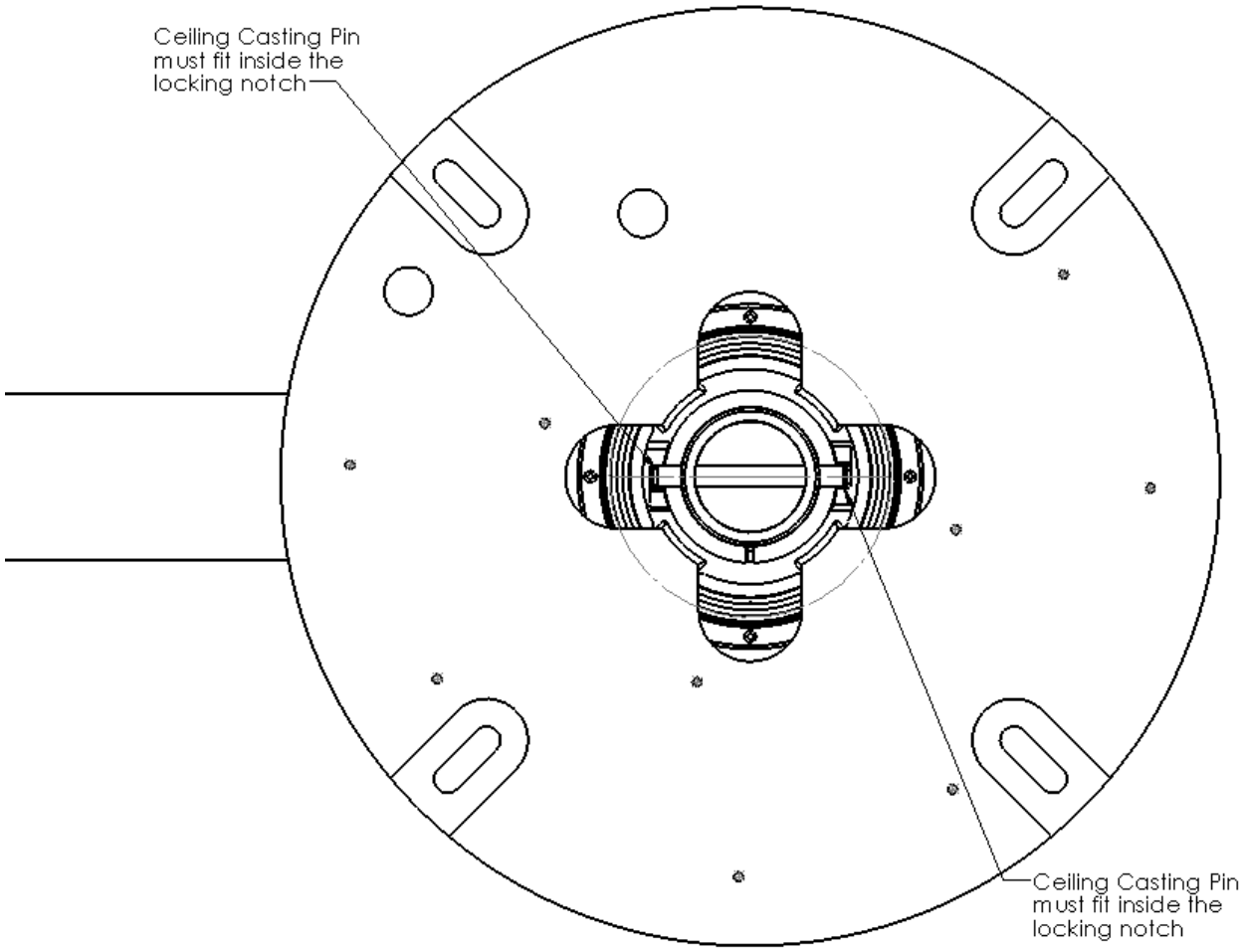


Figure 11: Ceiling & Shaft dowel pin locking.

Section 3

Arm Cable Termination

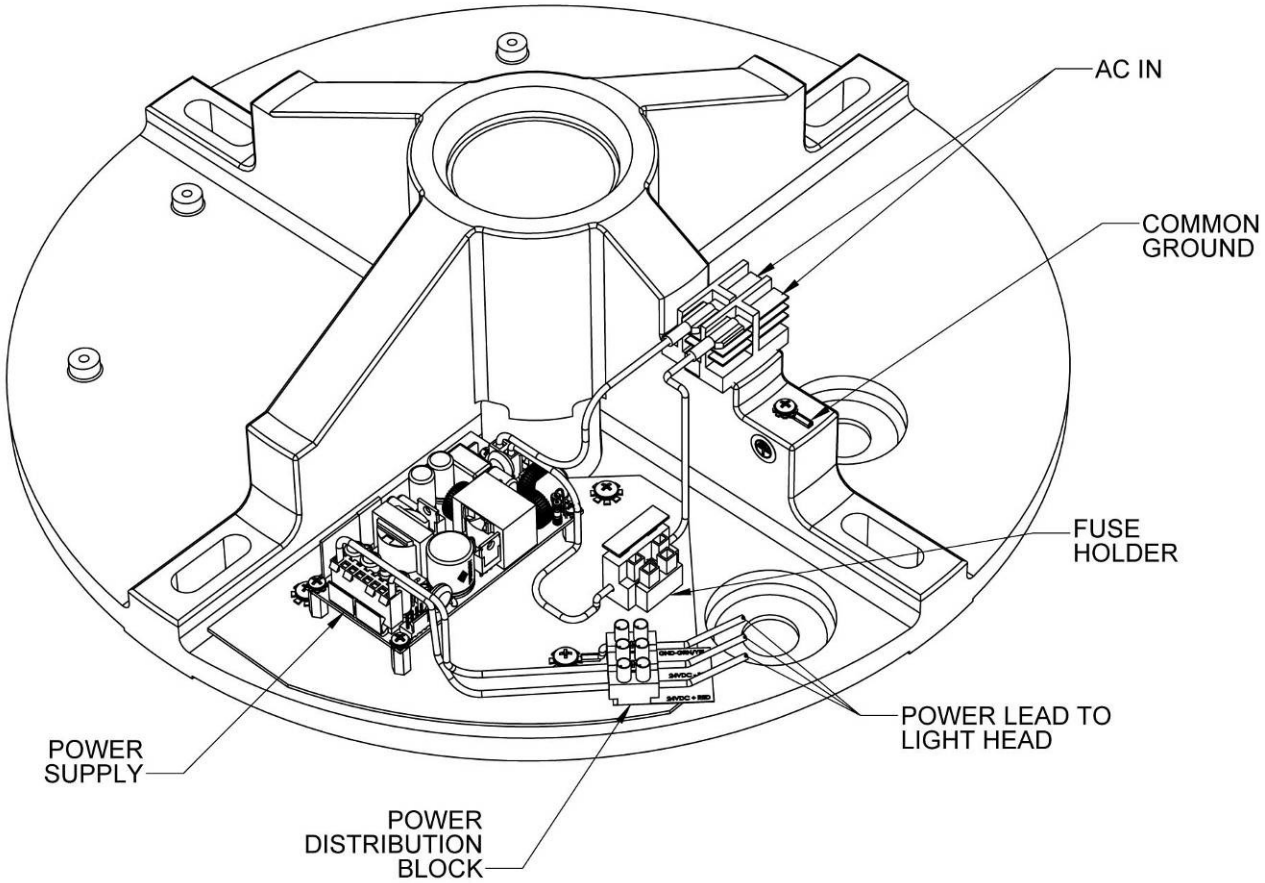


Figure 12: Arm Cable termination
(Note: Shown as a Solo with Power Supply)

The structural ceiling mount must be designed to support a vertical load of 300 lbs and an off center moment of 960 ft-lbs. The structural mount should meet all local building codes. A structural mount that does not meet these minimum conditions can cause serious injury and/or property damage.

Failure to use the correct mounting hardware can cause the arm/head assembly to become unstable, causing serious injury and/or property damage. If the ceiling mounting surface is not level, shim the ceiling casting to level the assembly.

Failure to level the ceiling casting may cause unwanted arm "drifting" during use.

Strip the power input cable ends and using the two ¼ wide quick connect connectors provided in the hardware kit, connect the primary input wires (from the Junction box) to the power distribution block and secure the ground wire to the protective earth terminal (ring lug & screw already installed on the ceiling casting). The protective earth screw will be designated with a ground symbol**.** Tie the two primary wires together (near the power distribution block) with the cable tie provided in the hardware kit. Strip the power cables from the Arm Assembly and connect each cable to the Power Distribution Block as indicated on the label.

Remove the two screws from the ceiling cover collet (see figure 9) using the Allen wrench provided in the hardware kit. Install the ceiling cover collet onto the ceiling shaft, insuring that two screws locations are positioned toward the floor. Tighten the two screws such that the collar does not slip down the rod by itself but can still be moved when pushed by hand.

Install the two ceiling casting covers in the groove on the ceiling collar. Install eight ¼ -20 screws provided in hardware kit to hold covers together. Slide the collar cover assembly, flush to the ceiling and tighten all screws.

Light Head Attachment and Locking Pin Removal

NOTE:
Do not remove pin until light head is installed on arm

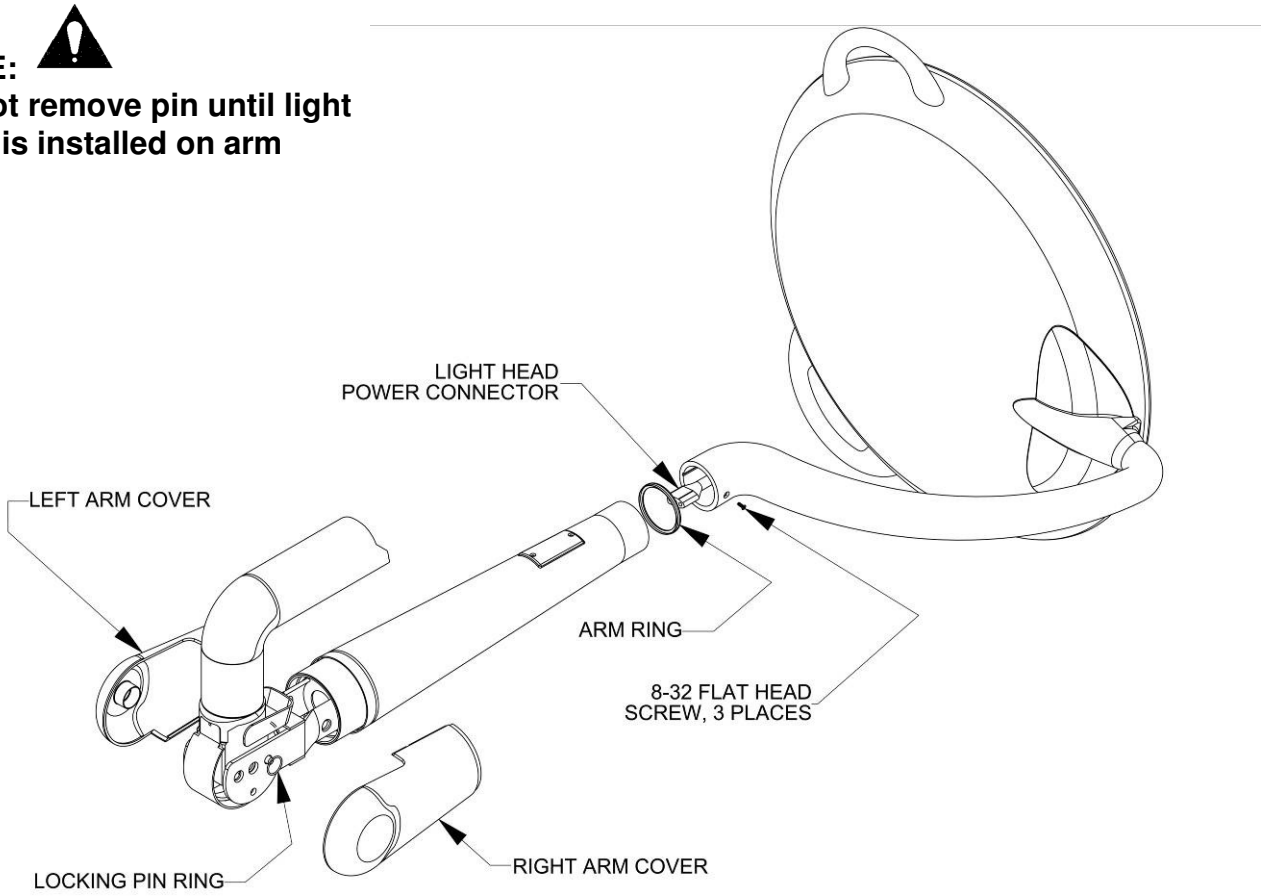


Figure 13: Locking Pin Removal

The arm assembly is shipped with a locking pin that prevents the arm from rotating vertically. Do not remove the locking pin until light head has been installed onto the arm assembly. Failure to do so can result in serious injury and/or property damage. Install the small arm ring onto arm assembly. Plug the Light Head Power Connector in the Arm into the Power Connector in the Yoke. Once connected, slide the head assembly over the shaft protruding from the arm and secure using three flat head screws provided in the hardware kit. Arms are keyed for the appropriate light head

Failure to install or tighten the flat head screws can cause the head assembly to fall causing serious injury and/or property damage.

Note: The pin must be removed before trying to operate the arm. Slightly pull the arm down releasing tension on the pin. The pin should easily pull out. Keep pin in a safe place for further use such as normal maintenance.

Remove the arm locking pin and install the plastic arm covers. Installation is now complete. Refer to the Operation Instructions before operating light and arm.

Section 4

Operating Instructions

To position the light head and arm, firmly grasp the sterilizable handle and move the light head or arm to the desired location.

On/Off & Dimmer Control: To turn the light on or off, depress the on/off intensity button on the bottom of the sterilizable handle. To dim the light intensity, depress the dimming button on the sterilizable handle. To dim further depress the button again. The dimming consists of five distinct increments with dimming values between 100 and 50% of total illuminance. The light head will automatically reset to full mode if the dimming button is depressed with the light on its lowest setting.

To adjust the light pattern (spot-size) grasp the sterilizable handle and rotate. Rotating the handle counterclockwise will increase the spot size. Rotating the handle clockwise will focus or tighten the spot. Note: Increasing the spot size can act as a dimmer as it will spread out the light pattern reducing intensity.

Head and Arm Movement

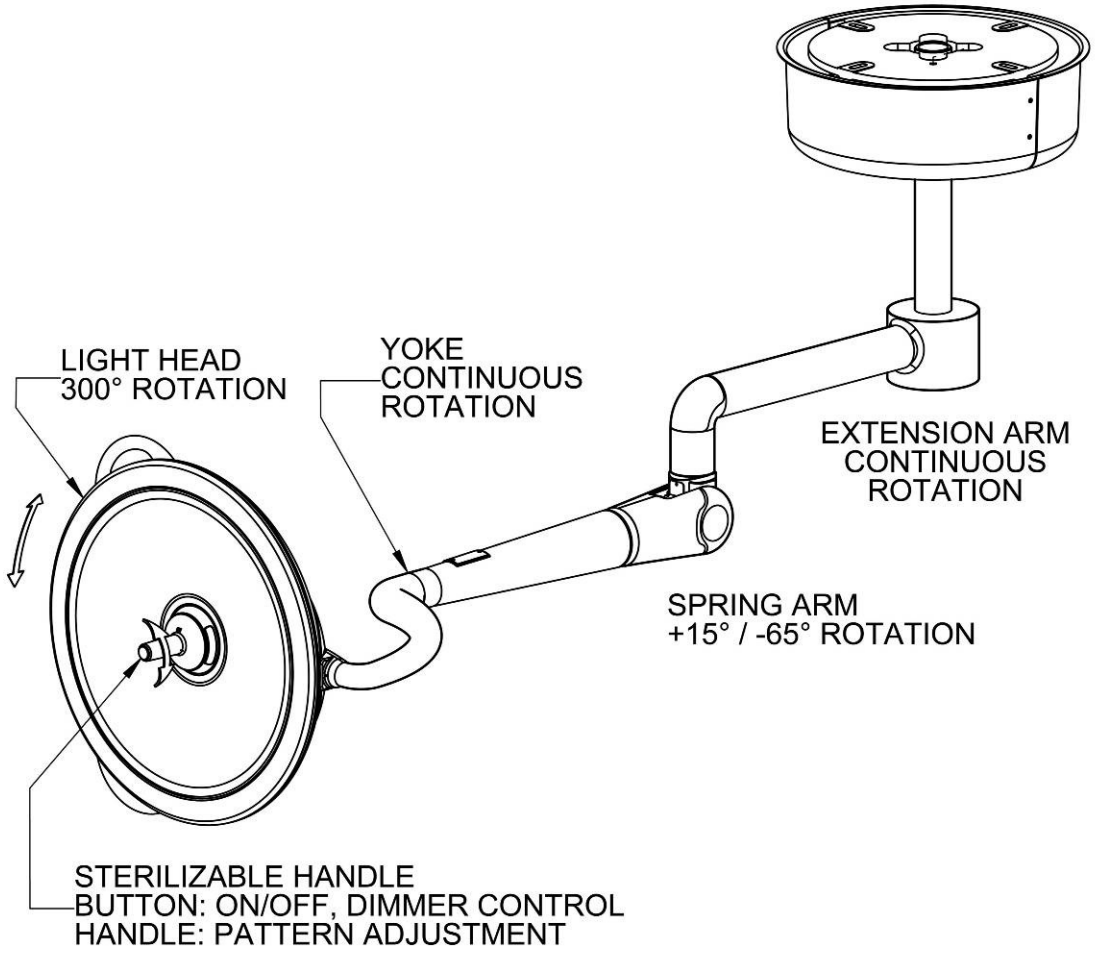


Figure 14: Head and Arm Movement
(Solo light shown)

Section 5

Safety Tips

Only facility authorized maintenance personnel should troubleshoot and/or repair the VistOR MS LED Surgical Lighting System. Troubleshooting by unauthorized personnel could result in personal injury and/or property damage.

The articulating arm is spring loaded. When removing the head/yoke ensure that the arm lock pin has been installed. Failure to do so could result in personal injury and/or property damage.

The articulating arm is spring loaded. Never remove the arm lock pin until the head/yoke has been installed. Failure to do so could result in personal injury and/or property damage.

Follow the product manufacturer's instructions. Failure to do so could result in personal injury and/or property damage.

If the unit fails any part of the preventive maintenance functional checks, repair the unit before use on any patient. Failure to do so could result in personal injury and/or property damage.

Do not use harsh cleaners, solvents, or detergents. Failure to do so could result in equipment damage.

Do not use silicone based lubricants. Equipment damage could occur.

The front lens is supplied with a protective hard coat to resist scratching. Never use abrasive cleaners on the front lens. Failure to do so could result in equipment damage.

Turn off main power before any repairs are started. Failure to do so could result in personal injury and/or property damage.

Do not pinch any wires during installation. Pinched wires can cause an electrical shock hazard, resulting in personal injury and/or property damage.

Use only Nuvo fuses P/N NV0003082 (120 & 230 VAC) P/N NV0003283 (230 VAC) if replacement is necessary. Failure to do so could result in personal injury and/or property damage.

Do not expose the unit to excessive moisture. Failure to do so could result in personal injury and/or property damage.

Do not rest articles or liquids on top of the VistOR MS LED Surgical Lighting System.
Spilled liquids will damage the light head and arm assemblies causing an electric shock hazard.

Section 6

Fuse Replacement

Turn off main power before fuses are replaced. Failure to do so could result in personal injury and/or property damage.

- To remove the ceiling cover halves, remove the eight ¼-20 attachment screws that hold the covers together. Pull the halves apart. It may be necessary to loosen the two ceiling collar screws and slide the collar down the ceiling rod.
- Locate the fuse holder. They will be on the ballast mounting plates.
- Replace defective fuse with Nuvo P/N-NV0003082(120 VAC) or P/N NV0003083 (230 VAC). Use only a 2.5 amp slow-blow fuse (NV0003082). or 1.25 amp slow-blow fuse (NV0003083).

Use only Nuvo fuses P/N NV0003082, P/N NV0003083 if replacement is necessary. Failure to do so could result in personal injury and/or property damage.

- Replace ceiling covers and restore main power to the unit.

Note: Do not use light should it continue to blow fuses. Contact the factory immediately.

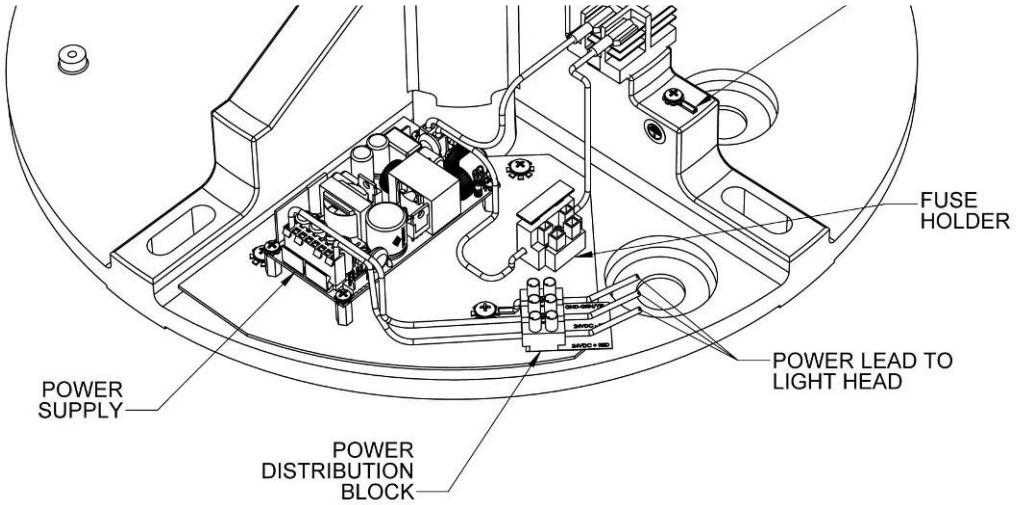


Figure 15: Fuse Replacement

Section 6

Arm Adjustment

If the articulating arm will not maintain its vertical position (up or down), the spring inside the arm needs to be adjusted

- Remove the two screws on the access cover.
- Lower the arm and head until the adjustment holes in the spring tension adjustment nut is accessible.

Make sure the adjustment rod is firmly in the spring tension adjustment nut before adjusting the spring. Failure to do so could result in personal injury and/or property damage.

- Turn the ¼" diameter rod clockwise to increase the tension in the spring (needed when light head tends to droop on arm). Turn the spring rod counterclockwise to decrease the tension in the spring. Continue to adjust until light head is again balanced.

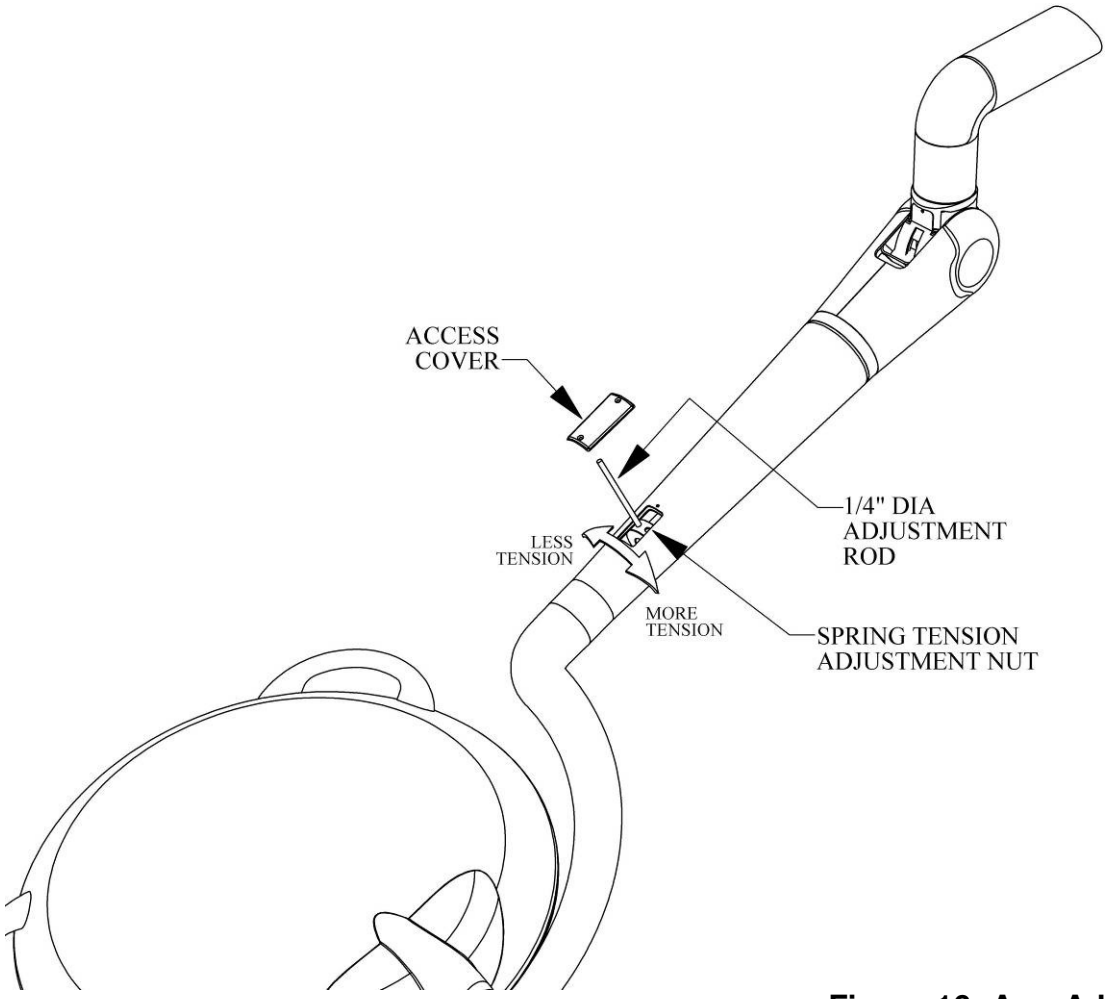


Figure 16: Arm Adjustment

Section 6

Head Adjustment

- To adjust the friction between the head and the yoke, rotate the head until the hole in the yoke is exposed, as shown below.
- Insert the 5/16” Allen wrench into the hole and tighten the set screw to increase the head friction or loosen the set screw to decrease head friction.

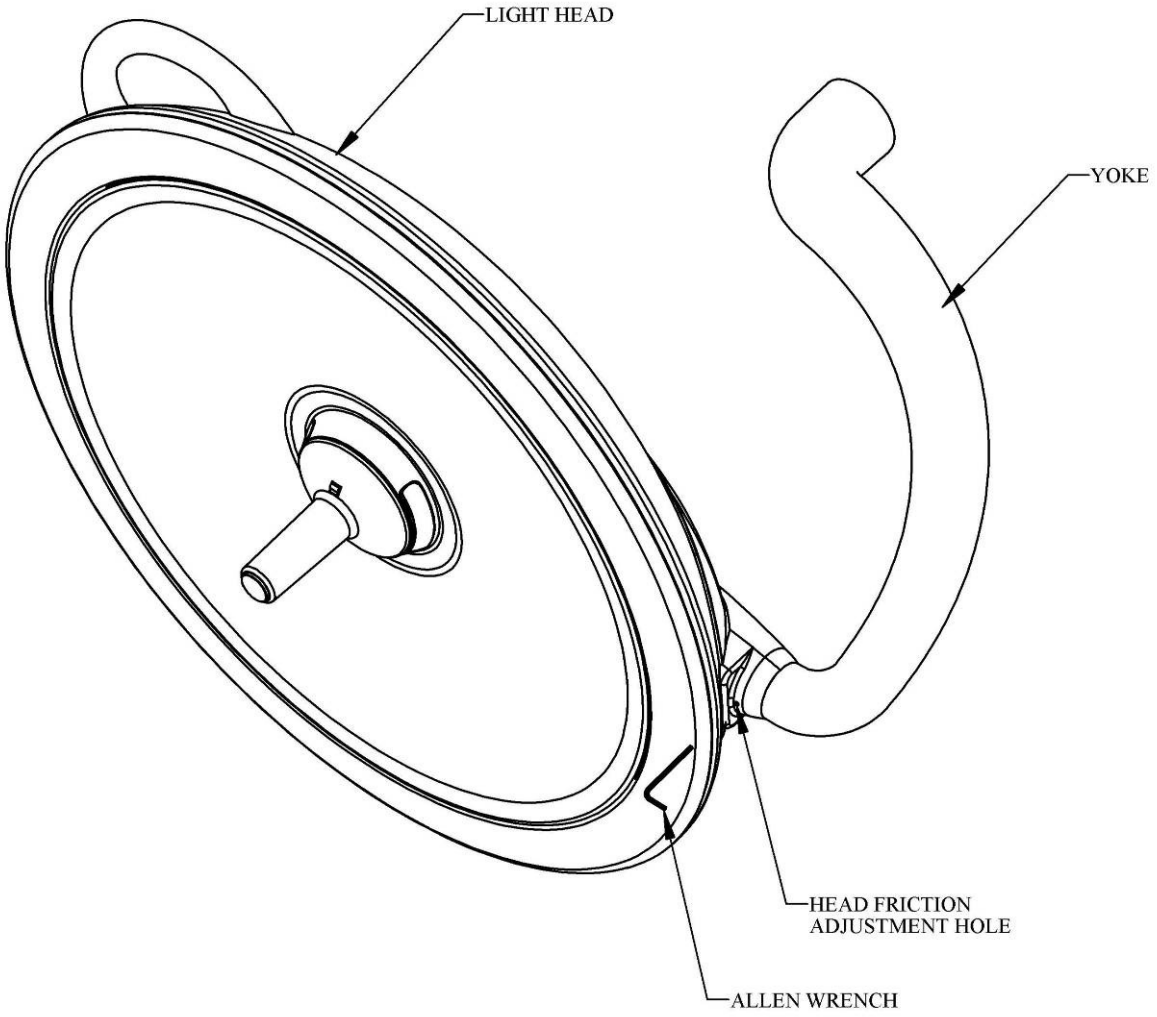


Figure 17: Light Head Friction Adjustment

Arm Friction Adjustment

Before setting tension, check mount for level/flex

- All arm/head assemblies have an internal brake to eliminate arm/head drifting during use. These brakes are pre-adjusted at the factory. If the whole arm assembly and head is drifting, adjust the brake closest to the ceiling casting.
- Using the Allen wrench (supplied in the hardware kit) turn the 2 set screws located on the arm housing clockwise to increase friction or counterclockwise to decrease friction. If the head and articulating arm are drifting, adjust the brake located on the extension arm.
- Using the Allen wrench (supplied in the hardware kit) turn the set screw (2 locations) located on the elbow clockwise to increase friction or counterclockwise to decrease friction.

Note: If the Arm exhibits excessive drifting, check that the Ceiling Mount is level and that the mounting bolts are tight and the Jack-Screw is securely tightened (see figure 9).

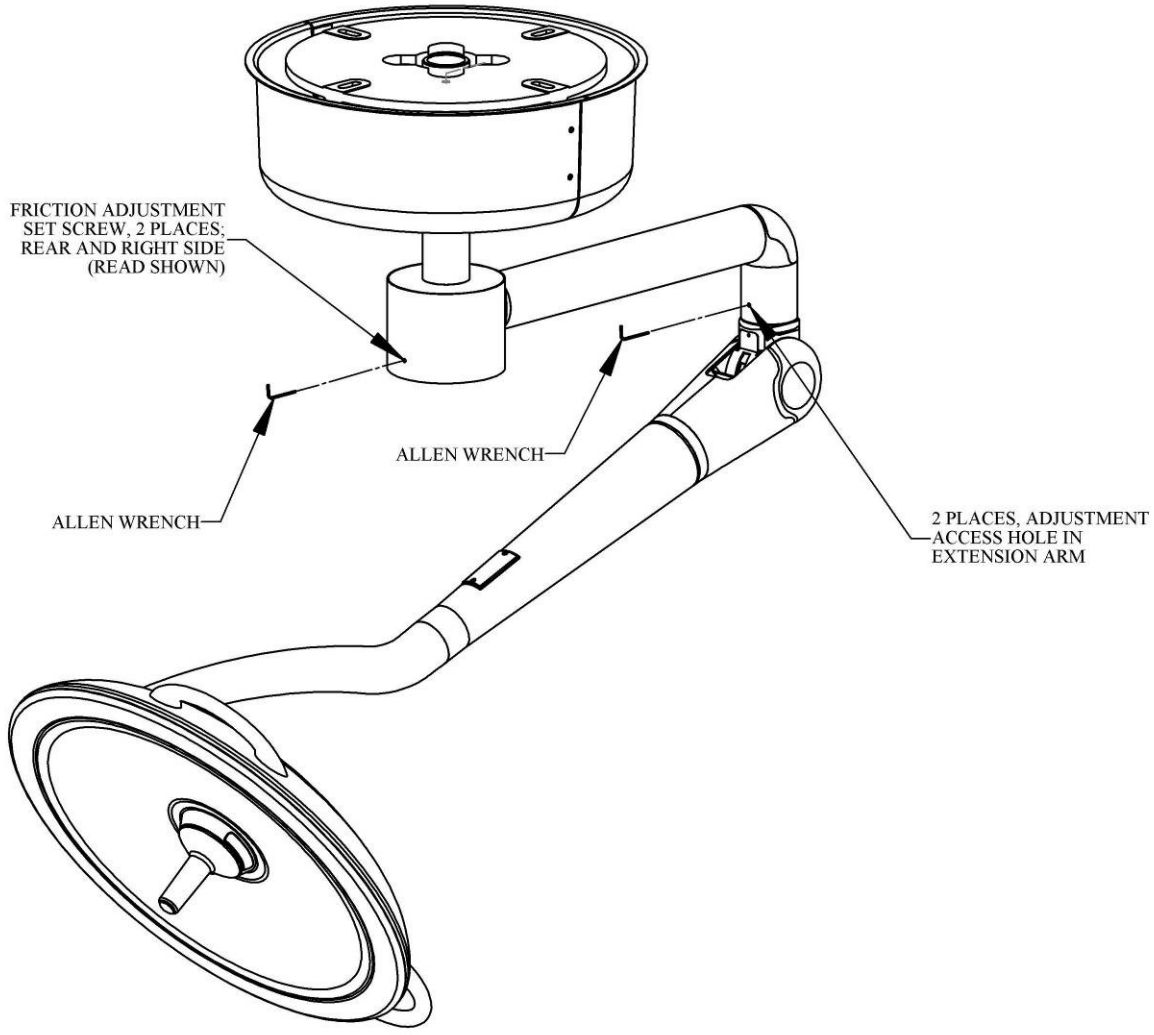

FRICTION ADJUSTMENT SET SCREW, 2 PLACES; REAR AND RIGHT SIDE (READ SHOWN)
ALLEN WRENCH
ALLEN WRENCH
2 PLACES, ADJUSTMENT ACCESS HOLE IN EXTENSION ARM

Figure 18: Arm Friction Adjustment
(solo light shown)

Section 6

Handle Sterilization

- Remove sterilizable handle by pressing the Handle Button near the base of the handle towards the center and pull the handle off the handle post.
- Sterilize the handle utilizing steam sterilization of minimum 250° Fahrenheit for a minimum of 30 minutes in compliance with AAMI-SSSa-1988 Good Hospital Practices, Steam Sterilization and Sterility Assurance, or equivalent method.

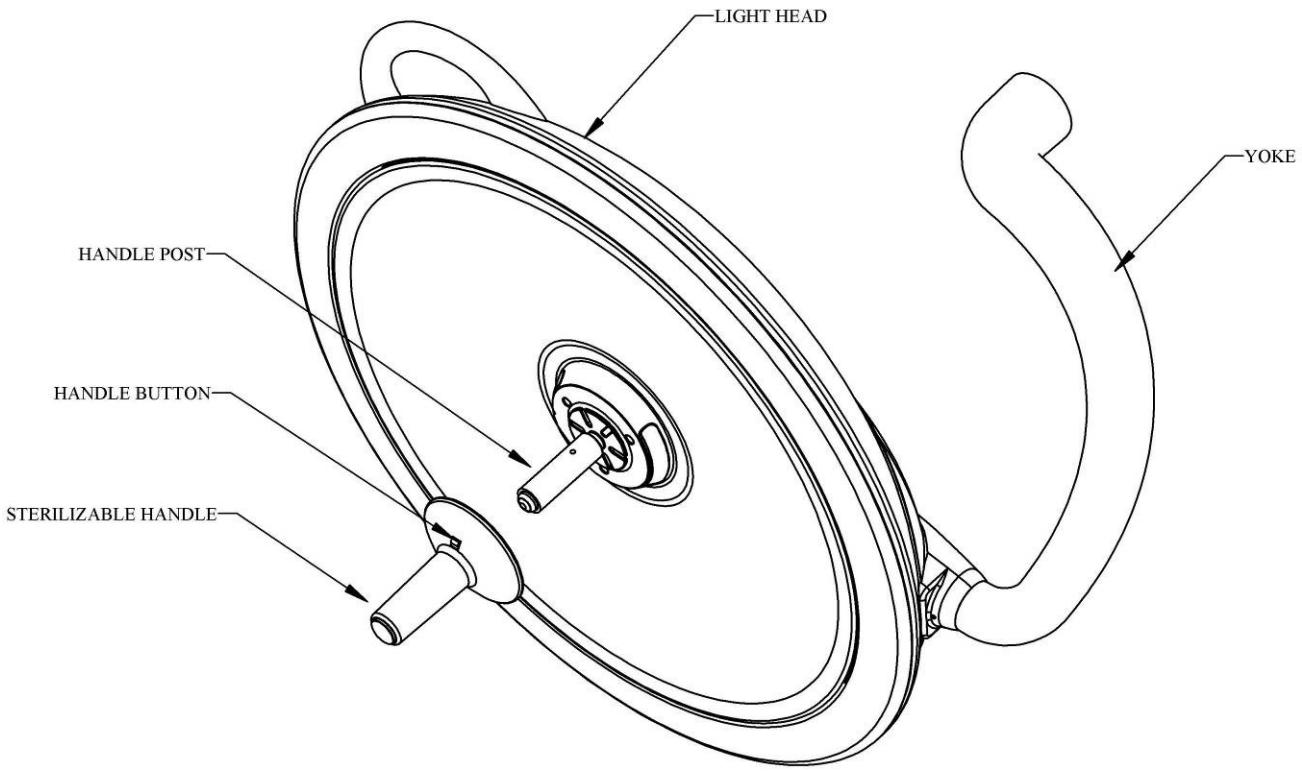


Figure 19: Handle Sterilization

Section 6

Cleaning Instructions

- The front lens is made from a UV resistant polycarbonate plastic that has an external hard coating to resist scratching. Clean the lens using glass/plastic cleaner or mild soap and water mix. It is very important to use a clean, soft cloth to avoid any scratching of the diffuser. Never spray the cleaning fluid directly onto the lens surface, but instead spray into clean cloth and then wipe the lens.
- Clean the light housing and arm using mild soap and water mixture. Apply this mixture to a clean cloth and wipe down the light head and arm. Never spray the cleaning fluid directly onto the light head or arm, but instead spray onto clean cloth and then wipe the light head and arm.

Do not use harsh cleaners, solvents, or detergents. Failure to do so could result in equipment damage.

The front lens is supplied with a protective hard coat to resist scratching. Never use abrasive cleaners on the front lens. Failure to do so could result in equipment damage.

Do not expose the unit to excessive moisture. Failure to do so could result in personal injury and/or property damage.

Table 1: Preventative Maintenance Schedule

Function	Procedure
Bolts and nuts	Check to see that all mounting and attachment bolts, set screws, pins, etc. are in place and securely tightened. Replace any missing bolts and re-tighten as required.
Moving joints/Adjustments	Check to make sure all moving joints function properly along the mounting system and head and arm system. If the articulating arm does not position properly (drifts from original position) refer to arm adjustment. If the light head drifts refer to light head friction adjustment. If this does not solve the problem contact customer service as the unit may require factory repair
Overall appearance	Check the general aesthetics of the VistOR MS LED Surgical Lighting System. The unit should be kept clean and dust free. Clean and dust as necessary.

Note: Maintenance schedules vary for each light depending on usage and operating instructions. An annual inspection of the equipment is recommended.

Note: Nuvo Inc., recommends that the maintenance records for this equipment be kept on file at the health care facility.

Section 7

Troubleshooting

Warning: Disconnect the light from the power supply before attempting any of the electrical checks mentioned below.

Problem	Cause	Remedy
Light will not turn on	1. Power to unit is off 2. Fuse is blown 3. Exposed wires are cut or damaged 4. Wire not connected correctly during installation 5. Wire connections made during installation have disconnected 6. No input power to light unit 7. Disconnected wires at power supply 8. No power output from power supply when input power to power supply is measured.	1. Turn on power (plug in unit) 2. Replace fuse/fuses (check for correct fuse) 3. Replace wire assembly 4. Check all wiring connections 5. Reconnect wires per the instructions 6. Check power input connections and circuit breakers 7. Reconnect wires 8. Replace faulty power supply
Light does not maintain its position vertically	Spring tension or friction is incorrect. Additional equipment was added to unit.	Adjust spring Remove additional equipment from arm.
Arm/Head assembly does not maintain its position horizontally (Orbital)	Ceiling casting mount is not level. Ceiling casting mounting screw are loose. Arm/Head needs friction adjustment. Jack-Screw is loose.	Level ceiling casting mount by shimming. Tighten ceiling casting mounting fasteners. Tighten Jack-Screw.
Light head is loose (drifts) at yoke interface	Head needs friction adjustment.	Adjust light head (see light head friction adjustment)
Light head will not rotate at yoke interface	Light head is against internal stop.	Rotate head in opposite direction.
Articulating arm cannot be moved any lower	Arm is against internal stop.	Rotate arm in opposite direction.
Articulating arm cannot be raised any higher	Arm is against internal stop.	Rotate arm in opposite direction.